IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

SATCO PRODUCTS, INC. *Plaintiff,* v. SIGNIFY NORTH AMERICA CORP. and SIGNIFY NETHERLANDS B.V. *Defendants,* and SIGNIFY NORTH AMERICA CORP. and SIGNIFY HOLDING B.V. *Counterclaim-Plaintiffs,* v. SATCO PRODUCTS, INC. *Counterclaim-Defendant.*	Civil Action No. 6:21-cv-00146-ADA **JURY TRIAL DEMANDED**

SATCO PRODUCTS, INC.'S OPENING CLAIM CONSTRUCTION BRIEF

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I. Introduction

Six patents are at issue in this case, all of which relate generally to LED lighting. Satco Products, Inc. ("Satco") asserts U.S. Patent Nos. 9,732,930, 10,344,952, and 10,533,712. Signify North America Corp., Signify Netherlands B.V., and Signify Holding B.V. ("Signify") assert U.S. Patent Nos. 8,272,756, 8,348,479, and 9,709,253.

The parties have identified eight terms whose construction is disputed. None of these terms are in the three Satco patents. Thus, this brief only discusses the three Signify patents. Also, the parties agreed that Satco, as counter-claim defendant, would file the opening claim construction brief.

II. U.S. Patent No. 8,272,756

A. Overview

The '756 patent (Ex. A)[1] is directed to lighting systems "incorporating a row of LEDs located in a reflective channel with a heat sink disposed alongside or behind the channel." ('756 patent at 1:16-21.) The '756 patent explains that LED lighting often encounters "efficiency degradation and premature failure of LEDs" because of heat accumulated during the operation of the LEDs. (*Id.* at 1:33-40.) According to the '756 patent, prior solutions often "lack[ed] integration," where "heat management systems [were] separated from the optical systems that handle the light output." Accordingly, it purports to solve the problem of "managing heat and light" when integrating LEDs into light systems by "remov[ing] heat via convection and conduction while controlling light with a suitable level of finesse." (*Id.* at 1:47-59.)

The solution described in the '756 patent uses an integrated member 110 "for managing light and heat generated by a light source," as shown below in Figures 1 and 3:

[1] All lettered exhibits to this brief are attached to the Declaration of Janis E. Clements in Support of Satco Products, Inc.'s Opening Claim Construction Brief, submitted concurrently.

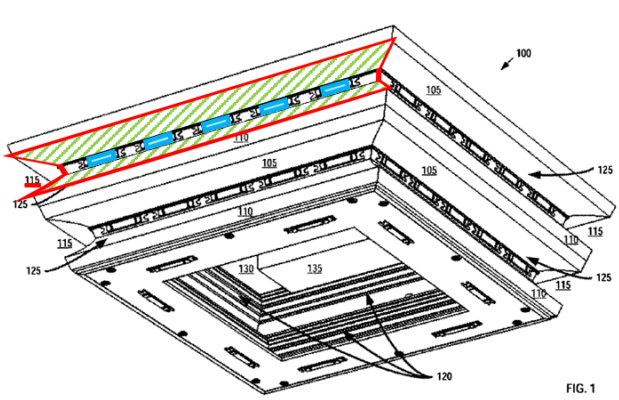


FIG. 1

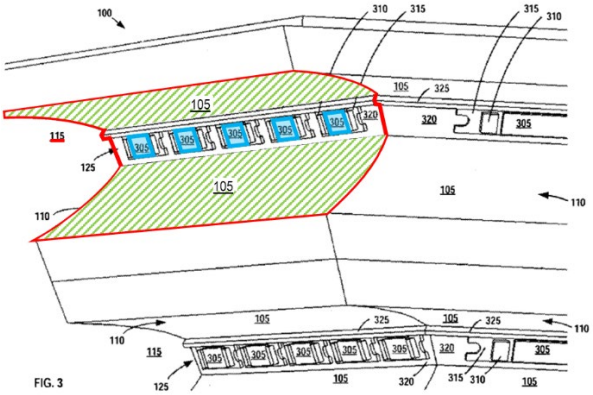
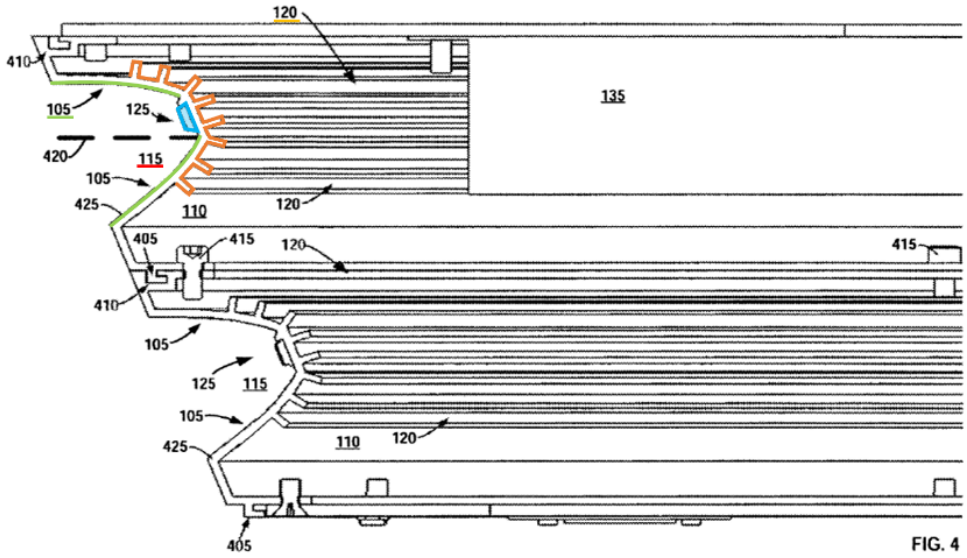


FIG. 3

(*Id.* at 1:65-67, Figs. 1 and 3.) On the outside of the integrated member 110, a row of LEDs (305, annotated in blue) are disposed in a channel 115 (annotated in red outline) "with a surface for reflecting light the LEDs produce" (105, annotated in green). (*Id.* at 2:12-21.) On the inside of the integrated member 110 are a plurality of protrusions (120, annotated in orange in Figure 4 below). The protrusions manage heat produced by the LEDs (annotated in blue). (*Id.* at 2:21-30.)



(*Id.* at Fig. 4.)

B. Agreed Terms

The parties agreed upon the following construction for the '756 patent:

'756 Claim(s)	Proposed Term(s)/Phrase(s)	Proposed Constructions
1-4	"a plurality of protrusions running alongside a back side of the flat surface, the first contoured surface, or the second contoured surface of the channel"	"a plurality of protrusions running alongside a back side of the flat surface, a back side of the first contoured surface, and a back side of the second contoured surface of the channel"

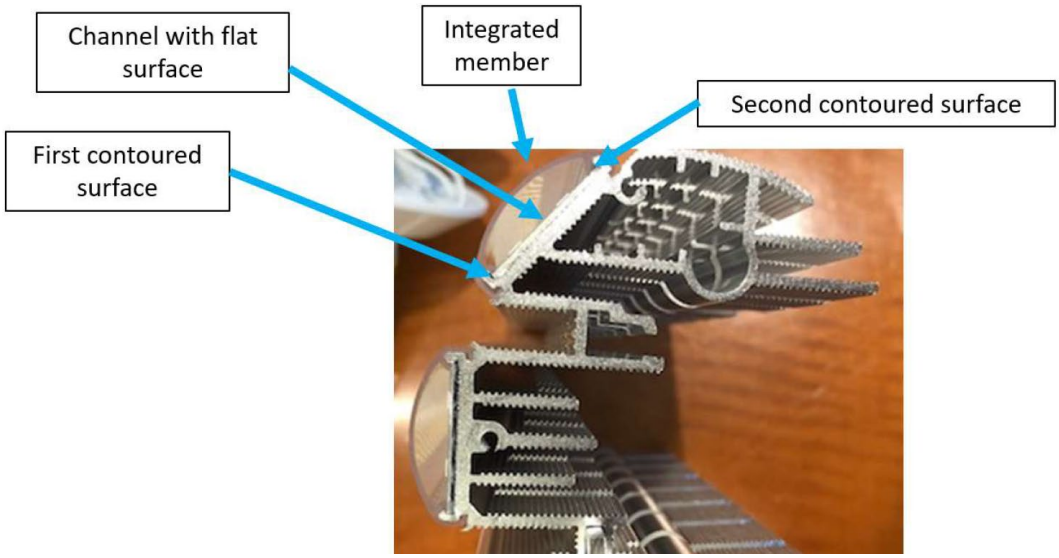
(Ex. B, Signify's Revised Proposed Constructions at 4.)

C. Disputed Terms

Term 1: "contoured surface(s)" ('756 patent – all claims)

Satco's Proposed Construction	Signify's Proposed Construction
"surface[s] shaped to have a geometry beneficial for light reflection"	Plain and ordinary meaning

The parties' dispute over the term "contoured surface(s)" concerns whether "contoured" limits the claimed "surface" to a particular type of shape, specifically, one that has "a geometry beneficial for light reflection." According to Signify, this term should be afforded its "plain and ordinary meaning." Signify's Preliminary Infringement Contentions suggest that its effective position is that any shape whatsoever is a "contoured surface" regardless of whether it is beneficial for light reflection. For example, Signify appears to allege that a small "lip" that holds a plastic cover is a "contoured surface":



(*See* Ex. C, Signify PIC, Ex. J-2 at 5.)

The term "contoured surface" appears in all claims of the '756 patent. As shown by representative claim 1 below, the claim language indicates that the "contoured surface" forms part of the "channel" where LEDs are mounted:

> 1. A lighting system, comprising:
> an integrated member comprising:
> a channel including a flat surface, a **first contoured surface** extending beyond a plane of the flat surface, and a **second contoured surface** extending beyond the plane of the flat surface and opposing the first contoured surface; and
> a plurality of protrusions running alongside a back side of the flat surface, the first contoured surface, or the second contoured surface of the channel; and
> a plurality of light emitting diodes mounted on one or more respective substrates that are disposed on the flat surface and in thermal contact with the integrated member, wherein each protrusion is operative to dissipate heat conducted by the light emitting diodes.

This claim shows that the two "contoured surfaces" are on the front side of the "channel," where they will reflect light from the LEDs. The LEDs are mounted on the "flat surface." The two "contoured surfaces" are on either side of the "flat surface," extending beyond its plane. In contrast, the plurality of heat-dissipating protrusions are on the back side of the channel: they run along the "back side" of the flat surface and the two contoured surfaces.

The claimed arrangement can be seen for example in Figures 4-5, which shows an LED (blue) mounted on the flat surface (320), two contoured surfaces 105 (green), and the plurality of protrusions (orange) on the back side of the flat and contoured surfaces:

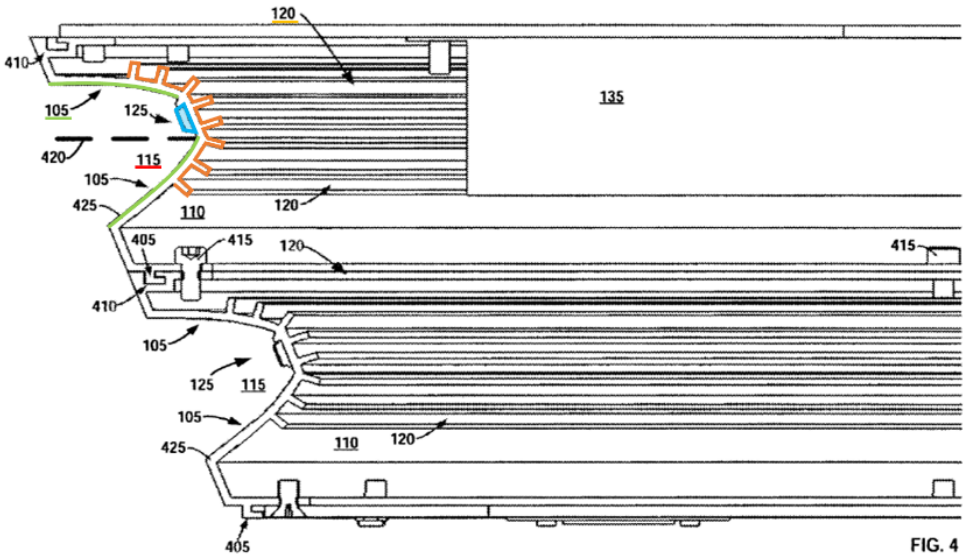


FIG. 4

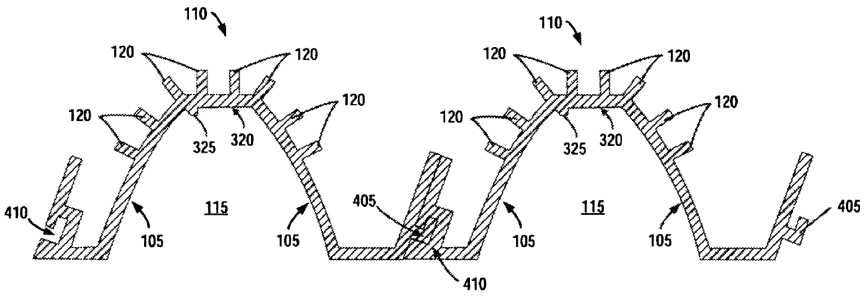


FIG. 5

The specification uses the term "contour" in two ways: to describe the shape of the heat sink, and to describe the shape of the reflective surface 105. Specifically, it explains:

> FIG. 5 further illustrates how a single member, in this case each extrusion 110, can provide structural support, light management via reflection from the surface 105, and thermal or heat management via the fins 120. In other words, one system can provide integrated heat and light management in a structural package. Moreover, a unitary or single body of material, in this example each extrusion 110, can have a reflective contour on one side and a heat-sink contour on the opposite side.

('756 patent at 7:47-55.) Thus, by showing that the claimed "contoured surfaces" are on the LED-mounting side of the channel, the claims show that the contours are reflective contours, not heat-sink contours.

Confirming this, the specification states that "The present invention relates . . . more

specifically to a luminaire incorporating a row of LEDs located in a reflective channel." (*Id.* at 1:16-21.) Similarly, the "Summary" states that a row of LEDs is disposed in a channel with "a surface for reflecting light," so that "the channel can manage light from the LEDs via reflection." (*Id.* at 2:12-21.) In every instance where the surfaces 105 of the channel are mentioned, they are described as reflective. (*Id.* at 4:29-31 ("Each channel 115 comprises *a reflective surface 105 for manipulating light* from the associated row of LEDs 125."); 7:47-50 ("Figure 5 further illustrates how a single member, in this case each extrusion 110, can *provide ... light management via reflection from the surface 105*…"); 8:56-57 ("*Reflective surfaces of channels control light* to provide desirable illumination pattern 810."); 4:31-40; 4:48-57 7:50-67; Figs. 1-5, 8.)

Satco's proposed construction comes directly from the specification's explanation of what the contoured surface is:

> Although FIG. 5 illustrates the reflective contour as a parabolic form, the reflective surface 105 can be flat, elliptical, circular, convex, concave, or some other geometry as may be beneficial for light manipulation in various circumstances.

(*Id.* at 7:61-67.)

The prosecution history of the '756 patent also supports Satco's proposed construction. Specifically, the examiner opined that prior art Everhart reference does not anticipate the claim because, while Everhart discloses a channel, it does not disclose the limitations of "the first surface and the second surface of the channel being *contoured*." (Ex. E, 2012-2-24 Rejection at 4.) The patentee agreed in its response, providing its own annotation of what Everhart purportedly discloses in the image below:

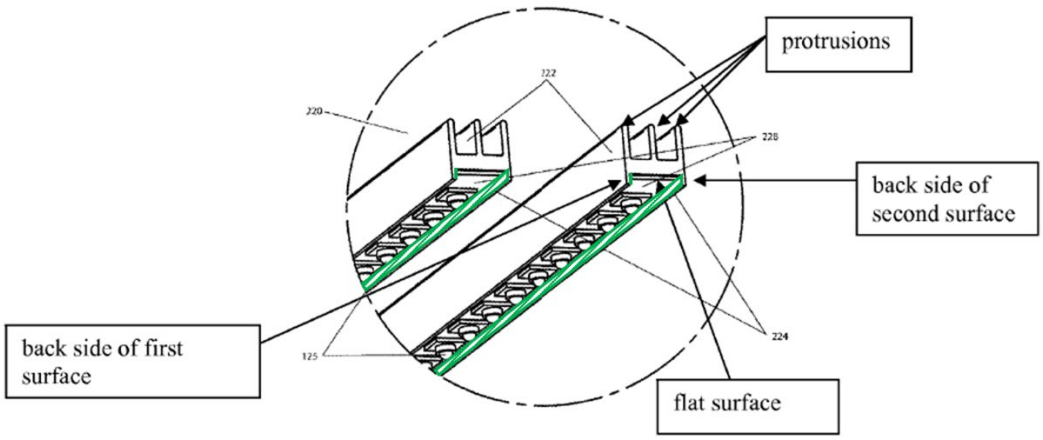


FIG. 8

> The Examiner admits that Everhart fails to teach or suggest the first and second surfaces being contoured. The Examiner asserts that element 224 generally points to the flat surface of the channel and that the side surfaces of 224 represent the first and second surfaces extending beyond the plane of the flat surface.

(Ex. E, 2012-5-24 Remarks at 9 (emphasis added).) This passage shows that the patentee and the examiner agreed that the short stub walls 224 (annotated above in green) meet the limitation of "surfaces," but not "contoured surfaces." Therefore, to the extent there were any doubt about the scope of the claimed "contoured surface," applicant confirmed in during prosecution of the '756 patent by explaining that Everhart's short stub walls 224 are not "contoured surfaces." *See Personalized Media Communs. LLC v. Apple Inc.*, 952 F.3d 1336, 1344-46 (Fed. Cir. 2020) (finding that a statement to the Patent Office that a prior art reference "does not teach the encryption of an entire digital signal transmission" was sufficient to resolve any ambiguity about whether the claims required the entire signal to be digital); *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1573 (Fed. Cir. 1997).

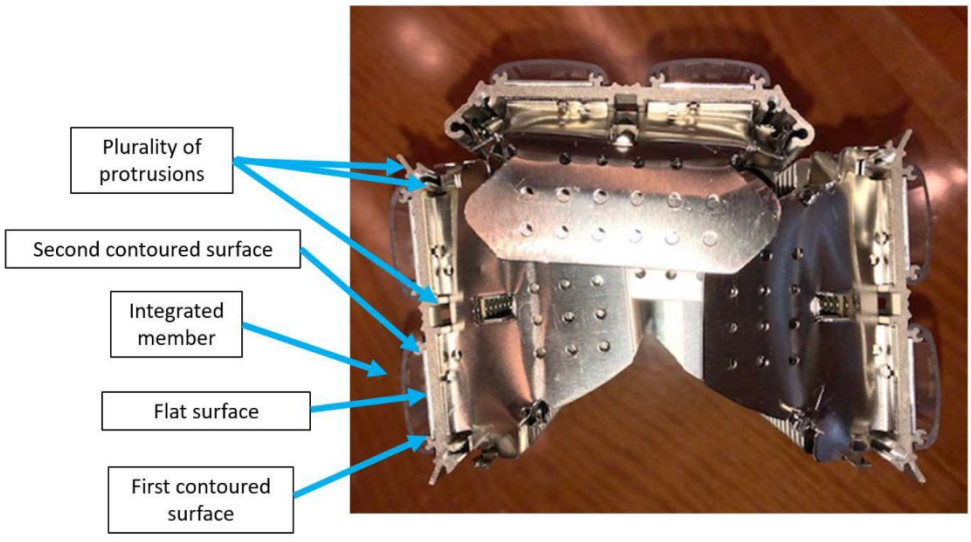
In sum, Satco's proposed construction is correct because it captures what the patent describes as the invention: a channel with a "reflective contour" on its front side.

Term 2: "at least two of the plurality of protrusions are disposed <u>outside</u> each of the flat surface, the first contoured surface, and the second contoured surface of the channel" (claim 5)

Satco's Proposed Construction	Signify's Proposed Construction
"at least two of the plurality of protrusions are disposed **<u>on the back side of</u>** each of the flat surface, the first contoured surface, and the second contoured surface of the channel"	Plain and ordinary meaning

The dispute over this term concerns whether the language "outside [a surface]" needs construction. Satco proposes that the term "outside" be construed as "on the back side of" to be consistent with the surrounding language in claim 5, and to clarify that this limitation requires at least two protrusions on the back side of each of the three surfaces—a total of at least ***six*** protrusions.

Signify takes the position that that this term be afforded its plain and ordinary meaning but does not explain what that meaning is. As illustrated by Signify's Preliminary Infringement Contentions, Signify takes that position in order to preserve an argument that ***three*** protrusions outside the channel meets this limitation—in other words, any protrusion outside the channel would be outside "each of" the surfaces of a channel.



(*See* Ex. D, Signify PIC, Ex. J-1 at 10 (annotation by Signify)). Accordingly, this term should be construed to adjudicate the parties' disagreement regarding its scope. *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1361 (Fed. Cir. 2008).

The meaning of the disputed term is clear from the claim language surrounding it. Claim 5 recites an integrated member comprising a channel that includes three surfaces, and "a plurality of protrusions" running alongside the back side of the three surfaces. And claim 5 further recites a "wherein" clause containing the language in dispute here to further define "the plurality of protrusions":

> 5. A lighting system, comprising:
> an integrated member comprising:
> a channel including a flat surface, a first contoured surface extending beyond a plane of the flat surface, and a second contoured surface extending beyond the plane of the flat surface and opposing the first contoured surface; and
> **a plurality of protrusions running alongside a back side of the flat surface, the first contoured surface, and the second contoured surface of the channel**; and
> a plurality of light emitting diodes mounted on one or more respective substrates that are disposed on the flat surface and in thermal contact with the integrated member, wherein each protrusion is operative to dissipate heat conducted by the light emitting diodes;
> **wherein at least two of the plurality of protrusions are disposed outside each of the flat surface, the first contoured surface, and the second contoured surface of the channel** and are operative to dissipate heat produced by the plurality of light emitting diodes.

The structure of claim 5 makes it clear that the "wherein" clause further defines "the plurality of protrusions" that are on the back side of the three surfaces by specifying their number and location: "at least two" outside "each" of the three surfaces, *i.e.*, a total of at least six protrusions.

This construction is also consistent with the prosecution history. The patentee amended "the plurality of protrusions are disposed out the channel" in response to anticipation and obviousness rejections to specify *how many* of the protrusions are disposed at *what location* outside the channel: "at least two" protrusions outside "each" surface.

> 4. (Currently Amended) The lighting system of Claim 1, wherein at least two of the plurality of protrusions are disposed outside each of the flat surface, the first contoured surface, and the second contoured surface of the channel and are operative to dissipate heat produced by the plurality of light emitting diodes.

(Ex. E, 2011-10-18 Office Action and 2012-2-17 Amendment and Response at 3.) Satco's proposed construction merely clarifies what the patentee sought to claim. Leaving this term unconstrued would allow Signify to revert its claims as they existed prior to amendment by arguing that this limitation only requires the plurality of protrusions be "disposed outside the channel." That is improper: the claim language that Signify adopted to obtain allowance must be given effect.

III. U.S. Patent Nos. 8,348,479 and 9,709,253

A. Overview Of The Patents And Asserted Claims

The '479 and '253 patents (Exs. F and G) share a common specification. They claim priority through various continuations to four provisional applications filed between September 21, 2007 and August 20, 2008.

The '479 and '253 patents state that "traditional recessed light fixtures have not used LED light sources," and that "a need currently exists in the art for a recessed light fixture that uses an LED light source." ('479 patent, 2:5-7.)[2] To address this, the patents describe "[a] recessed light fixture [that] includes a single LED package that is configured to generate all light emitted by the recessed light fixture." ('479 patent at Abstract; 2:12-15.)

The patents explain that "[a] recessed light fixture is a light fixture that is installed in a hollow opening in a ceiling or other surface." (*Id.* at 1:45-50.) For example:

[2] For convenience, Satco will only cite to the '479 patent when referring to the shared specification of the '479 and '253 patents.

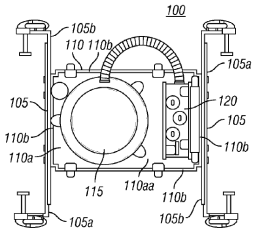


FIG. 1

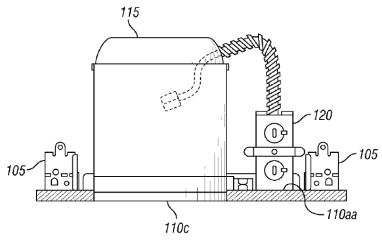
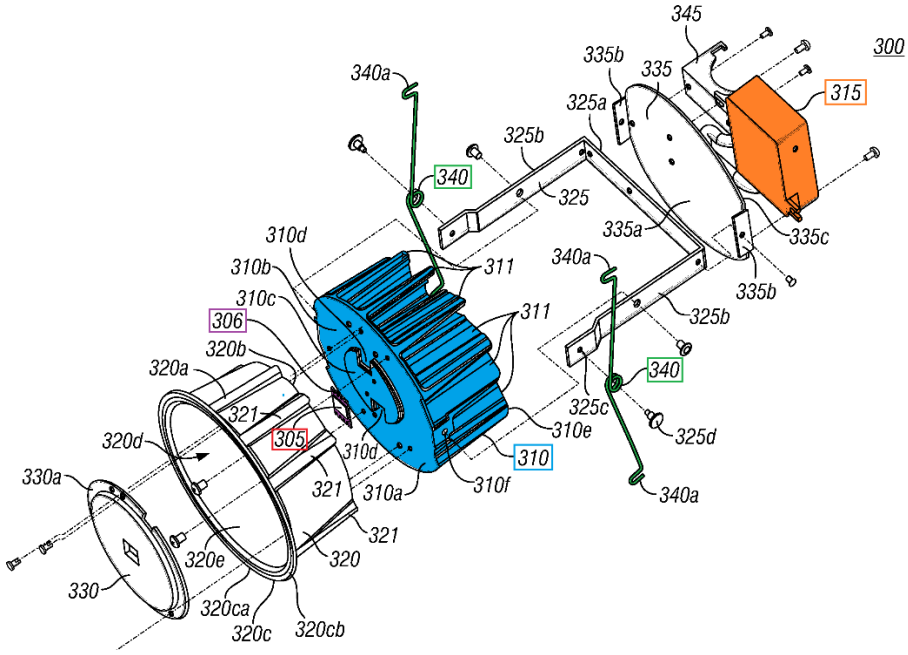


FIG. 2

In these figures, 115 is a "a can-shaped receptacle for housing a light source" and 120 is a "junction box." (*Id.* at 4:55-64.) The patents describe an "LED module" that is mounted in the "recessed can housing," for example with "torsion springs" (green) (*id.* at 9:30-36), as shown in annotated Figure 8 below. The LED module 300 includes an LED package 305 (red) mounted to heat sink 310 (blue). (*Id.* at 5:32–35.) The LED package 305 includes one or more LEDs (not shown) and substrate 306 (purple), and is electrically connected to driver 315 (orange) for supplying electrical power to the LED package. (*Id.* at 5:39–40, 6:46–48.)



(Fig. 8 (annotated).)

The asserted claims of the '479 patent are: **1**, 2, 4, 5, **13**, 14, 16, 19, 20 (independent claims in bold). These claims are generally directed at a downlight module for the recessed light fixture

described in the Abstract, which uses "a single LED package that is configured to generate all light emitted by the recessed light fixture." ('479 patent, Abstract; 2:12-15.) Claim 1 of the '479 patent is shown below, with disputed terms in italics:

> 1. A downlight module, comprising:
> *a light emitting diode ("LED") package* comprising a plurality of LEDs mounted to a common substrate*;*
> a *heat sink* coupled to the LED package; and
> at least two torsion springs located on opposite side surfaces of the downlight module proximal to an open end of the downlight module, wherein the torsion springs are used to mount the heat sink and LED package within a recessed light fixture,
> *wherein the LED package generates substantially all of the light emitted by the recessed lighting fixture through the open end of the downlight module.*

The asserted claims of the '253 patent are: **1**, 2-5, 8, 10-15, **16**, 17, 20-29, **30**, 31-41 (independent claims in bold). These claims are generally directed at downlight modules that use an "adapter" like the one shown in Figure 16 (right). The adapter has an "Edison screw-in plug" at one end and a "connector" at the other end to connect to the driver: claim 1 requires a "plug connector" and claims 16 and 30 require a "quick-connect connector." Claim 1 of the '253 patent is shown below, with disputed terms in italics:

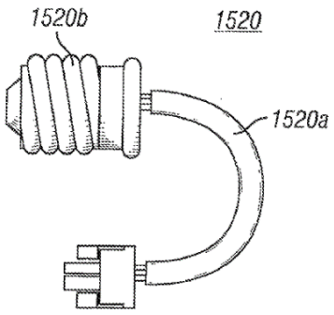


FIG. 16

> 1. A downlight module for use with a recessed housing located above a ceiling, comprising:
> a *heat sink*, wherein the *heat sink includes an inner surface*;
> at least one LED light source coupled to *the inner surface of the heat sink*, wherein the at least one LED light source is oriented to emit light out of the downlight module;
> a driver electrically coupled to the at least one LED light source; and
> an adapter comprising an Edison screw-in plug at one end of the adapter and a plug connector at an opposing end of the adapter,
> wherein the plug connector is configured to electrically couple and mechanically couple the adapter to the driver, and
> wherein the Edison screw-in plug is configured to electrically couple the driver to an Edison base socket.

B. Agreed Terms

The parties agreed upon the following construction for the '479 patent:

'479 Claim(s)	Proposed Term(s)/Phrase(s)	Proposed Constructions
13, 19	"means for mounting the heat sink and LED package within a recessed light fixture"	§112, ¶6 Function: mounting the heating sink and LED package within a recessed light fixture Structure: Torsion springs

(Ex. B, Signify's Revised Proposed Constructions at 3.)

C. Disputed Terms: '479 Patent

Term 3: "light emitting diode ("LED") package" (all claims)

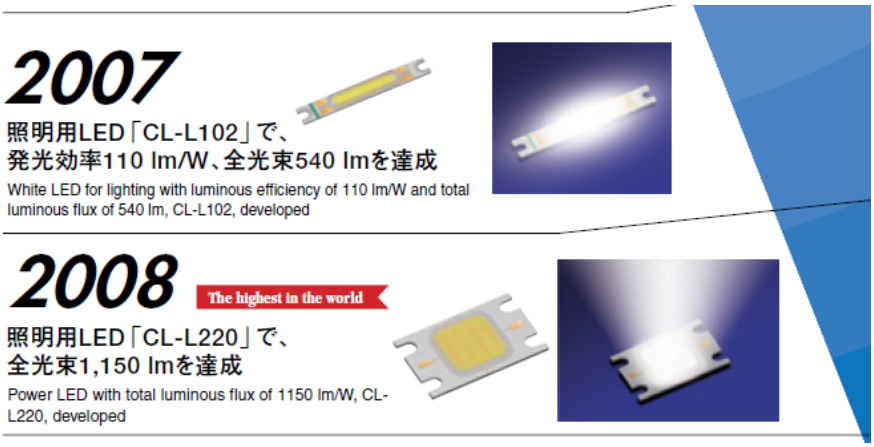
Satco's Proposed Construction	Signify's Proposed Construction
ordinary meaning (i.e., an "LED package" is a ~~plastic, glass, or ceramic~~ casing for one or more LED chips/dies, which both protects the chip(s) and allows them to be connected externally, e.g., to printed circuit board)	Plain and ordinary meaning

The dispute is about the meaning of the term "LED package." Signify's Preliminary Infringement Contentions show that it is attempting give "LED package" a meaning different from how it would be understood by a person of ordinary skill.

The term "package" is a technical term used to describe the casing that semiconductor chips—such as LED chips—are put inside: chips are "packaged" after they are manufactured (as wafers) and separated into chips/dies. (Declaration of John W. Curran, Ph.D. in Support of Satco Products, Inc.'s Opening Claim Construction Brief, submitted concurrently ("Curran Decl.") ¶ 35.) There are whole textbooks on chip "packaging." (Curran Decl. ¶ 36.) Packaging protects chips and allow them to be connected externally. (Curran Decl. ¶ 35, 44, 46.)

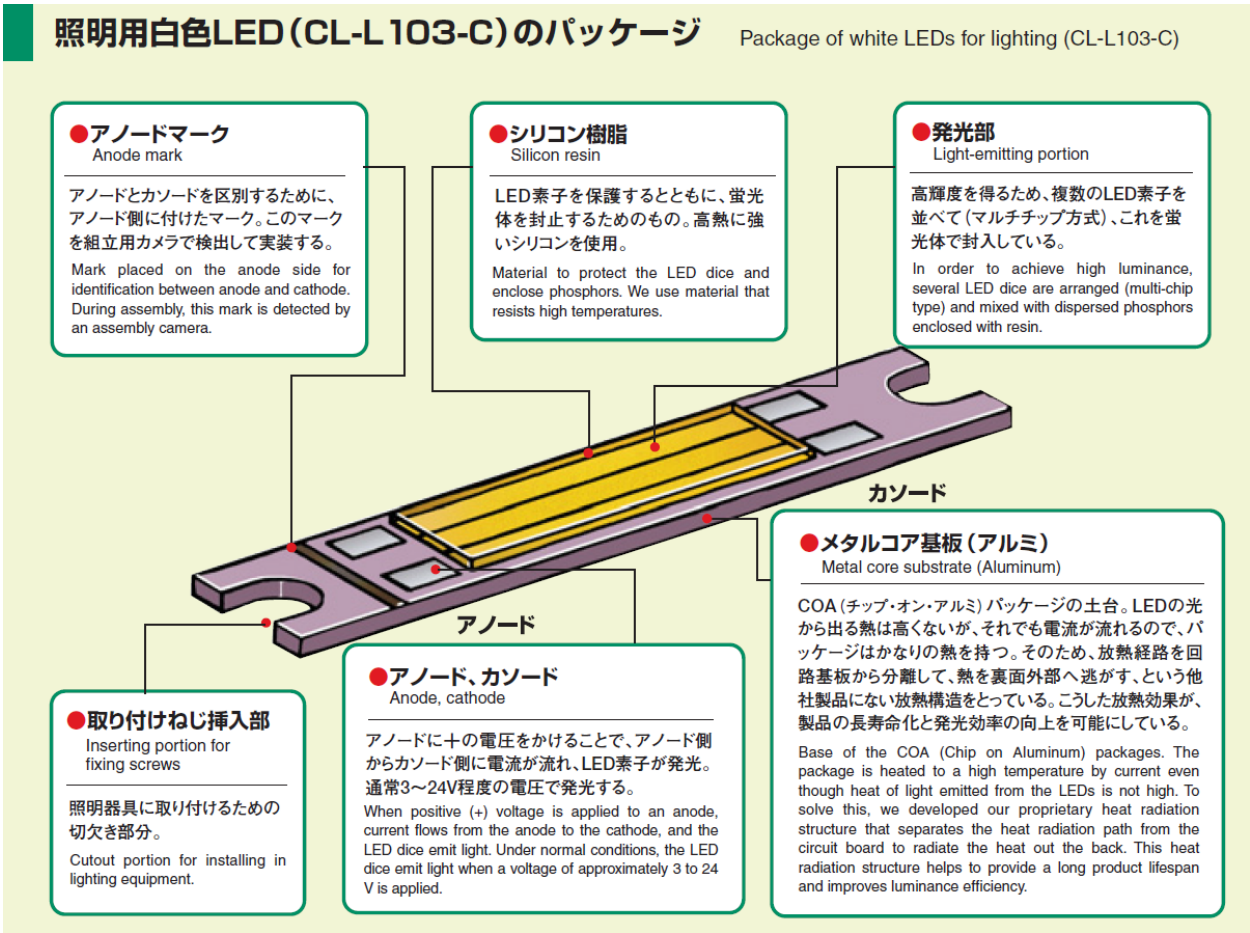
The '479 specification shows that it uses the term "package" in this ordinary sense in multiple ways. First, it states that "In certain exemplary embodiments, the LED package 305 is a

CL-L220 package, CL-L230 package, CL-L240 package, CL-L102 package, or CL-L190 package manufactured by Citizen Electronics Co., Ltd." ('479 patent at 6:22-30.)[3] A person of ordinary skill would be familiar with these packages. (Curran Decl. ¶¶ 48-53; Curran Exs. 1-5.) For example, images of the CL-L102 and CL-L220 packages are shown below:

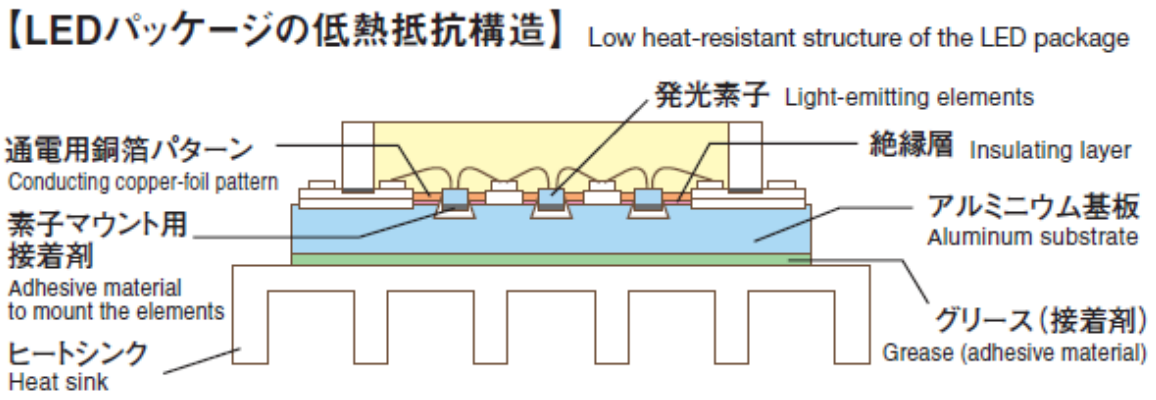


(Curran Ex. 5 at SATCO-WDTX_00010070.) The detailed illustration below, also taken from the Citizen "Device Handbook," shows aspects of the design of the CL-L103 package, which is shaped similarly to the CL-L102. The package contains a substrate, electrical connections, and multiple LED chips enclosed in resin:

[3] "Citizen Electronics Co., Ltd." will hereinafter be referred to as "Citizen".



(*Id.* at SATCO-WDTX_00010066.) A further illustration below, again from the Citizen "Device Handbook," shows an LED package with an aluminum substrate (blue) mounted on a heatsink (white) with an adhesive (green). Again, the package contains a substrate, electrical connections, and multiple LED chips:



(*Id.* at SATCO-WDTX_00010065.) The datasheets for the Citizen LED packages listed in the specification also show LED packages that include a substrate and LED chips protected by a resin. (Curran Exs. 1-4.)

Second, the specification explains that an LED package 305 contains one more LEDs mounted on a substrate 306, as shown in the examples above from the Citizen "Device Handbook":

> The LED package 305 includes one or more LEDs mounted to a common substrate 306. The substrate 306 includes one or more sheets of ceramic, metal, laminate, circuit board, mylar, or another material. Each LED includes a chip of semi-conductive material that is treated to create a positive-negative ("p-n") junction.

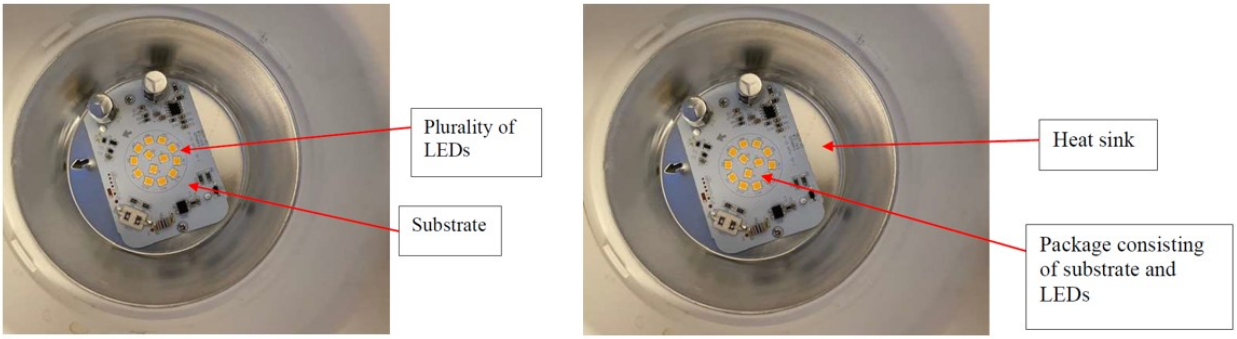
('479 patent, 6:4-6:14.)

Third, the specification explains that an LED package includes an encapsulation material, e.g., a polymer, "for creating white light" and for providing "protection":

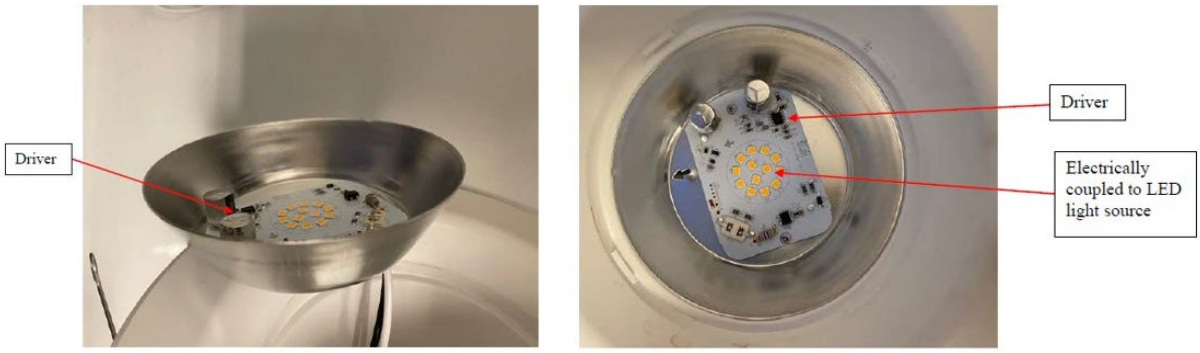
> In certain exemplary embodiments, an optically transmissive or clear material (not shown) encapsulates at least a portion of the LED package 305 and/or each LED therein. This encapsulating material provides environmental protection while transmitting light from the LEDs. For example, the encapsulating material can include a conformal coating, a silicone gel, a cured/curable polymer, an adhesive, or some other material … In certain exemplary embodiments, phosphors are coated onto or dispersed in the encapsulating material for creating white light.

(*Id.* at 6:4-6:14.)

Signify's Preliminary Infringement Contentions show that it is applying a different construction of "LED package." For example, Signify alleges that the dozen LED packages in Satco's S29313 product are the claimed "plurality of LEDs," and that those packages (yellow) plus the circuit board (white) on which they are mounted are the claimed "LED package."



(Ex. H, Signify PIC, Ex. I-2 at 3, 4.) While Signify has not explained its position, it appears to be applying a non-technical understanding of the word "package": just as an Amazon package might contain a number of unrelated items, Signify appears to assert that the claimed "LED package" includes the dozen LED packages and the circuit board they are mounted on, which also holds the LED driver:



(Ex. I, Signify PIC, Ex. H-4 at 5, 9.)

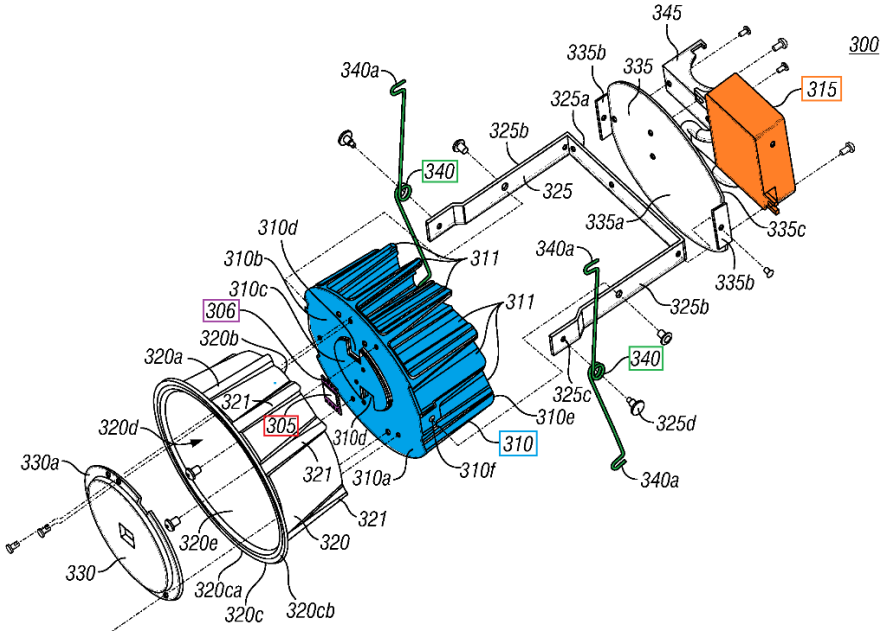
Signify's position is contradicted by the specification. The specification explains that the "driver" is a separate component that is not part of the LED package:

> When the LED package 305 is electrically coupled to a power source, such as a driver 315, current flows …

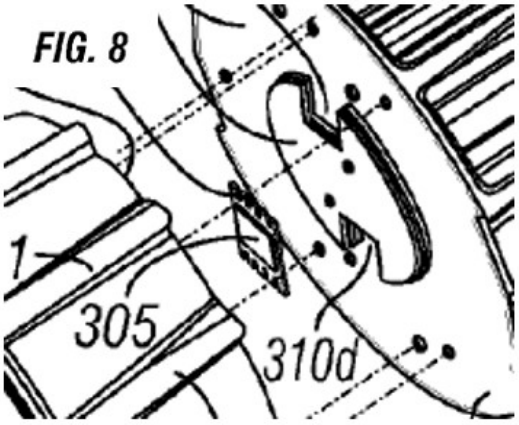
('479 patent at 5:39-48.) Similarly, it explains:

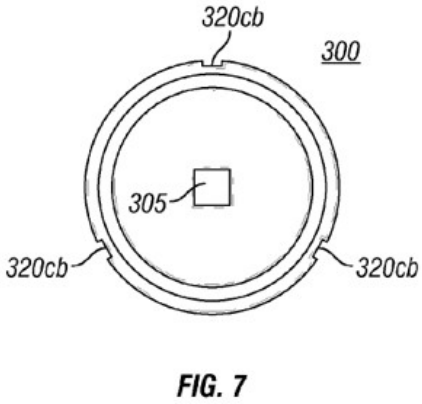
> The substrate 306 is electrically connected to support circuitry (not shown) and/or the driver 315 for supplying electrical power and control to the LED package 305. For example, one or more wires (not shown) can couple opposite ends of the substrate 306 to the driver 315, thereby completing a circuit between the driver 315, substrate 306, and LEDs.

(*Id.* at 6:46-51.) This is confirmed by Figure 8, which as annotated below shows that the driver 315 (orange) is a separate component that is not part of the LED package 305 (red):



Additionally, the specification shows in Figures 7 and 8 that "LED package 305" is a single device, not multiple packages and other components mounted on a circuit board:





('479 patent, Fig 8 (cropped), Fig. 6.)

Extrinsic evidence also supports Satco's position. The Illuminating Engineering Society ("IES")—a leading standard setting organization for the illumination industry—defines "LED package" as "[a]n assembly of one or more LED dies that includes wire bond or other type of

electrical connections, possibly with an optical element and thermal, mechanical, and electrical interfaces. Power source and ANSI standardized base are not incorporated into the device." (Curran Ex. 6 at 25.) In contrast, the IES defines "LED array or module" as "[a]n assembly of LED packages (components), or dies on a printed circuit board or substrate, possibly with optical elements and additional thermal, mechanical, and electrical interfaces that are intended to connect to the load side of a LED driver." (*Id.*) These definitions show that Signify is incorrectly interpreting "LED package" to mean "LED array." (Curran Decl. ¶¶ 54-56.)

Signify's extrinsic evidence also supports Satco's construction. For example, Signify cites to "Thermal Management of LEDs: Package to System" which lists a "LED package" as including, "chip, wire-bonds, encapsulation, lens, lead-frame over-mold, and submount." (Curran Ex. 7 at 65.)

Accordingly, a person of ordinary skill would understand that a "LED package" refers to a casing for one or more LED chips/dies, which both protects the chip(s) and allows them to be connected externally, e.g., to printed circuit board.

Term 4: "the LED package generates substantially all of the light emitted by the recessed lighting fixture" (all claims)

Satco's Proposed Construction	**Signify's Proposed Construction**
ordinary meaning (the previously-identified LED package generates substantially all of the light emitted by the recessed lighting fixture)	Plain and ordinary meaning

The dispute here is the same as for Term 3: it arises from Signify's incorrect interpretation of "LED package" as encompassing what the IES separately defines as an "LED array."

The specification shows that Satco is correctly applying the ordinary technical meaning of "LED package" when it explains the advantages of using a single LED package:

> By using a single, relatively compact LED package 305, the LED module 300 has one light source that produces a lumen output that is equivalent to a variety of lamp types, such as incandescent lamps…"

(*Id.* at 6:25-30.) This shows that the '479 specifically contemplates using single light source, not an array of light sources. (Curran Decl. ¶¶ 60-65.)

Term 5: "heat sink" (all claims; also '253 patent, all claims)

Satco's Proposed Construction	**Signify's Proposed Construction**
a heat-conductive device that reduces heat in the downlight module.	plain and ordinary meaning

Signify asserts that "heat sink" should have its "plain and ordinary meaning" and does not need any construction. But Signify's Preliminary Infringement Contentions appear to show that Signify contends that anything, heat-conductive or not, can be a heat sink. (Curran Decl. ¶ 68.) Thus, because the parties disagree over the scope of "heat sink," it should be construed. *O2 Micro*, 521 F.3d at 1361; *see also Whirlpool Corp. v. TST Water, LLC*, 2016 U.S. Dist. LEXIS 96301, at *31 (E.D. Tex. July 22, 2016) ("These disputed terms are technical terms and are potentially confusing, so '[t]he Court believes that some construction of the disputed claim language will assist the jury to understand the claims.'").

The claims of the '479 patent describe a LED downlight module that can be mounted within a recessed light fixture. The downlight module comprises "a heat sink coupled to the LED package." (*See, e.g.*, '479 patent at claims 1 and 13.)

The claims of the '253 patent are directed to LED downlight modules that can be used in a recessed housing by coupling the LED downlight module to an Edison base socket using an Edison connector. The downlight module comprises "at least one LED light source coupled to . . . the heat sink" (claim 1), "at least one light emitting diode (LED) in thermal communication with the heat sink" (claim 16), or "at least one light emitting diode (LED) thermally coupled to the heat

sink" (claim 30). A person of ordinary skill would understand from the surrounding claim language in the '479 and '253 patents that a LED is "coupled to" / "in thermal communication with" / "thermally coupled to" the "heat sink" which is "a heat-conductive device that reduces heat in the downlight module" by drawing heat away from the LED. (Curran Decl. ¶¶ 69-71.)

The specification of the '479 and '253 patents supports Satco's proposed construction. Specifically, the patents state that LEDs "generally require . . . thermal management systems" when used in "traditional recessed light fixtures." ('479 patent at 2:2-7.) Accordingly, the specification shows that the "heat sink" must conduct heat away from the LEDs and reduce heat in the downlight module:

- "LEDs generate a substantial amount of heat that raises the operating temperature of the LEDs if allowed to accumulate. This can results [sic] in efficiency degradation and premature failure of the LEDs. The heat sink 310 is configured to manage heat output by the LEDs in the LED package 305. In particular, the heat sink 310 is configured to conduct heat away from the LEDs even when the lighting fixture 100 is installed in an insulated ceiling environment." (*Id.* at 6:55-63);

- "The LED package can be coupled to a heat sink for dissipating heat from the LEDs. The heat sink can include a core member from which fins extend. Each fin can include one or more straight and/or curved portions." (*Id.* at Abstract);

- "[t]he LED package can be thermally coupled to a heat sink configured to transfer heat from the LEDs." (*Id.* at 2:24-25);

- "heat from the LEDs can be transferred along a path from the LEDs to the core member [of the heat sink], from the core member to the radial portions of the fins, from the radial portions of the fins to their corresponding straight portions, and from the corresponding straight portions [of the heat sink] to a surrounding environment." (*Id.* at 2:26-38);

- "The radius and length of the radial portion 311a and the length of the straight portion 311b can vary based on the size of the heat sink 310, the size of the LED module 300, and the heat dissipation requirements of the LED module 300." (*Id.* at 7:31-34); and

- "As illustrated in FIG. 10, the heat sink 310 is configured to dissipate heat from the LED package 305 along a heat-transfer path that extends from the LED package 305, through the bottom surface 310a of the heat sink, and to the fins 311 via the core 905. The fins 311 receive the conducted heat and transfer the conducted heat to the surrounding environment (typically air in the can 115 of the lighting fixture 100) via convection. For example, heat from the LEDs can be transferred along a path from the LED package 305 to the core 905,

> from the core 905 to the radial portions 311a of the fins 311, from the radial portions 311a of the fins 311 to their corresponding straight portions 311b, and from the corresponding straight portions 311b to a surrounding environment. Heat also can be transferred by convection directly from the core 905 and/or the fins 311 to one or more gaps between the fins 311." (*Id.* at 7:47-62, Fig. 10.)

The specification, including Figures 3, 5, 6, 8, 9, 10, and 12, also makes clear that the heat sink is a structure made of a material configured to "conduct" heat, i.e., is a heat-conductive device:

- "The heat sink 310 is composed of any material configured to conduct and/or convect heat, such as die cast metal." (*Id.* at 6:63-65);
- "The core 905 [of the heat sink] is a member that is at least partially composed of a conductive material." (*Id.* at 7:17-18); and
- "The reflector housing can be configured to receive a reflector and to serve as a secondary heat sink for the LED module. For example, the reflector housing can be at least partially composed of a conductive material for transmitting heat away from the LED package." (*Id.* at 2:45-50.)

Therefore, a person of ordinary skill would understand from the patent specifications that, consistent with its normal use, a "heat sink" refers to a "a heat-conductive device that reduces heat in the downlight module." (Curran Decl. ¶¶ 72-74.)

The prosecution history of the '479 patent also supports Satco's proposed construction. For example, in response to a Petition for *Inter Partes* Review, the patent owner indicated: "The LEDs are mounted on a substrate 306 that is mounted to heat sink 310 to facilitate heat dissipation. (*Id.* at 5:39-48, 6:37-45.) . . . Heat sink 310 transfers heat from the LED light source and thus prolongs the life of the LED package. (*See id.* at 2:24-25, 6:59-65)." (Ex. J, IPR 2017-01858, Paper No. 6 (filed Nov. 16, 2017) at 4.) Therefore, it is clear that the heat sink must actually "manage heat generated by the LEDs" (*id.* at 3), i.e., reduce heat in the downlight module, in order to prolong the life of the LED.

Similarly, the patent owner has also previously represented that "the patents make clear that a heat sink is simply a structure that transfer heat from the light source" and that "[t]he patents

state that the heat sink is made of a conductive material." (Ex. K at 23.) Both of these statements are consistent with the fact that a heat sink "is a heat-conductive device that reduces heat in the downlight module."

Other extrinsic evidence, including dictionaries and articles from the relevant time period, also supports Satco's proposed construction. Heat sinks are understood in the art to be "devices that enhance heat dissipation from a hot surface, usually the case of a heat generating component, to a cooler ambient, usually air." (*See* Curran Ex. 8, "How to Select a Heat Sink," Seri Lee, Electronics Cooling, June 1995, at 2.) "Heat sinks must prevent overheating in electronic devices and components. To do this, they must be made of certain materials, which have a good degree of thermal conductivity." (*See* Curran Ex. 9, "What Makes a Good Heat Sink?" Simon Dalley, Elmelin Ltd., June 2019, at 1.) "Essentially, the heat sink acts as a pathway for any heat being generated to dissipate away from the device or component." (*Id.*) The most effective heat sink "has fins in its design that provide the necessary surface area to dissipate the heat." (*Id.*)

As discussed above (for Term 3), the patent specification teaches the use of LED packages from Citizen ('479 patent at 6:22-25.) The Citizen "Device Handbook" teaches that a heat sink is a "heat dissipation device":

> An issue to be solved for LEDs is how to efficiently expel the heat. The LED package surface area is extremely small, and little heat is discharged into the atmosphere. The heat must be emitted by connecting the LED package to a heat dissipation device such as a heat sink. The base of the LED package is composed of conducting copper-foil pattern, insulating layer, and aluminum substrate from top to bottom. Contrary to others, we have mounted the light-emitting device on the aluminum substrate with high heat conductivity, instead of the insulating layer with low heat conductivity. Therefore, the heat generated from light-emitting device can be effectively conducted to the heat sink connected to the package.

(Curran Ex. 5 at SATCO-WDTX_00010065.)

A person of ordinary skill would understand that a heat sink can be made of heat-conductive materials like copper and aluminum (which are good heat conductors) but not from materials like rubber and fiberglass (which are poor heat conductors). (*See* Curran Ex. 11 (*Thermal Conductivity of selected Materials and Gases*, Engineering ToolBox (2003), *available at*: https://www.engineeringtoolbox.com/thermal-conductivity-d_429.html (accessed December 20, 2020); Curran Ex. 12 (*Thermal Conductivity of Metals, Metallic Elements and Alloys*, Engineering ToolBox (2005), *available at*: https://www.engineeringtoolbox.com/thermal-conductivity-metals-d_858.html (accessed December 20, 2020).) Thus, while all materials transfer heat, copper transmits heat faster than aluminum, and both copper and aluminum transmit heat much faster than rubber or fiberglass. This is why it often makes more sense to pick up a hot pot with rubber gloves than it does to use the short metal handles attached to the pot (though a long enough metal handle can dissipate enough heat to remain relatively cool at a distance from the pot). It is also why a person of ordinary skill would make a heat sink out of copper or aluminum (which are heat-conductive), but not out of rubber or fiberglass (which are insulators). (Curran Decl. ¶¶ 77.)

Signify's extrinsic evidence also supports Satco's proposed construction. For example, the NLPIP Light Answers article teaches that a heat sink is made of "material that can conduct heat away from the LED," i.e., heat-conductive material:

> Any material that can conduct heat away from the LED can serve as a heat sink. Most metals are excellent conductors of heat and therefore many LED manufacturers suggest that mounting materials containing metal frames, fasteners and connectors be used, and that the contact area between the LED and its mounting surface be maximized. It is also important to make a good thermal contact between the LED and its mounting surface.

(Curran Ex. 13 at SIGNIFYTX_00018402.) Similarly, Signify relies upon the article, "Thermal Management of LEDs: Package to System," which indicates, "[s]tandard heat sink materials with conductivities of 75 to 200 W/m-K are suitable for system level thermal management." (Curran

Ex. 7 at SIGNIFYTX00018380.)

And, while Signify relies upon the McGraw-Hill Dictionary of Scientific and Technical Terms (6th ed. 2003) for other terms, it ignores its definition of "heat sink," which is: "(electricity) a mass of metal that is added to a device for purpose of absorbing and dissipating heat" (Curran Ex. 14.) The Illustrated Dictionary of Electronics (2001), similarly defines "heatsink": "A heat exchanger in the form of a heavy, metallic mounting base or a set of radiating fins. It conducts heat away from such devices as power transistors, heavy-duty resistors, or power tubes, and dissipates the heat into the surrounding environment via convection and radiation." (Curran Ex. 15.)

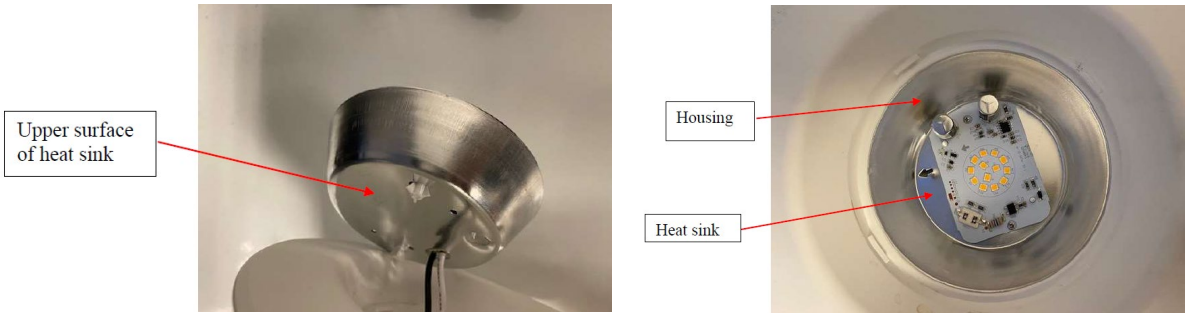
Accordingly, a person of ordinary skill at the time of the '479 and '253 patents would have understood that a "heat sink" is "a heat-conductive device that reduces heat in the downlight module."

Term 6: "formed integrally"/ "integrally formed" (claim 19; also '253 patent, claims 17 and 32)

Satco's Proposed Construction	Signify's Proposed Construction
formed as a single unit from the same material	Plain and ordinary meaning

Claims 12 and 19 of the '479 patent require that "the reflector housing is formed integrally with the heat sink." ('479 patent at claim 6 and 13.) Similarly, claims 17 and 32 of the '253 patent require that "the heat sink and the housing are integrally formed."

Satco understands that Signify does not challenge the part of Satco's construction that reads "formed as a single unit," but does challenge the part that requires "from the same material." Signify's Preliminary Infringement Contentions appear to show that Signify contends that "the reflector housing is formed integrally with the heat sink" term can be satisfied by two distinct structures that are screwed or bolted together:



(Ex. I, Signify PIC, Ex. H-4 at 31, 41.)

The only use of "formed integrally" in the patent specification comes from the following passage, where the specification shows that having the reflector housing "formed integrally" with the heat sink is an alternative to having the reflector "secured to the heat sink" with fasteners or adhesive:

> The top surface 320bb includes one or more holes 320bc capable of receiving fasteners that secure the reflector housing 320 to the heat sink 310. Each fastener includes a screw, nail, snap, clip, pin, or other fastening device known to a person of ordinary skill in the art having the benefit of the present disclosure. In certain alternative exemplary embodiments, the reflector housing 320 does not include the holes 320bc. In those embodiments, the reflector housing 320 is formed integrally with the heat sink 310 ***or*** is secured to the heat sink 310 via means, such as glue or adhesive, that do not require holes for fastening.

('479 patent at 8:9-27 (emphasis added).) This passage shows that the phrase "formed integrally" cannot include two distinct structures that are connected together. To the contrary, it refers to things that are "formed from a single unit from the same material." (Curran Decl. ¶ 87.)

D. Disputed Terms: '253 Patent

Term 5: "heat sink" (all claims) (*see above*)

Term 6: "formed integrally"/ "integrally formed" (claims 17, 32) (*see above*)

Term 7: "[LED light source coupled to the] inner surface of the heat sink / heat sink includes an inner surface" (claims 1-5, 8, 10-15)

Satco's Proposed Construction	Signify's Proposed Construction
Indefinite	Plain and ordinary meaning

A claim is invalid for indefiniteness if its language, read in light of the intrinsic evidence, "fail[s] to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014).

Here, it is undisputed that the phrases "inner surface of a heat sink" / "heat sink includes an inner surface" appear only in certain claims of the '253 patents. Nothing in the specifications or prosecution histories refers to an "inner surface of a heat sink." As the term lacks any established meaning in the art, and the intrinsic record fails to inform a POSITA with reasonable certainty about the objective bounds for the scope of the term, it is indefinite. (Curran Decl. ¶¶ 91-94.)

The patent specification teaches that the heat sink has a "bottom" or "lower" surface 310a, an "upper surface" or "top end 310e," and "side surfaces 310f," as illustrated in Figure 8 (annotated below):

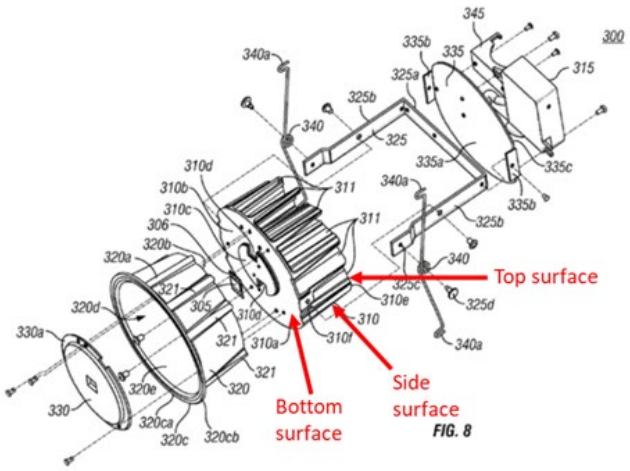


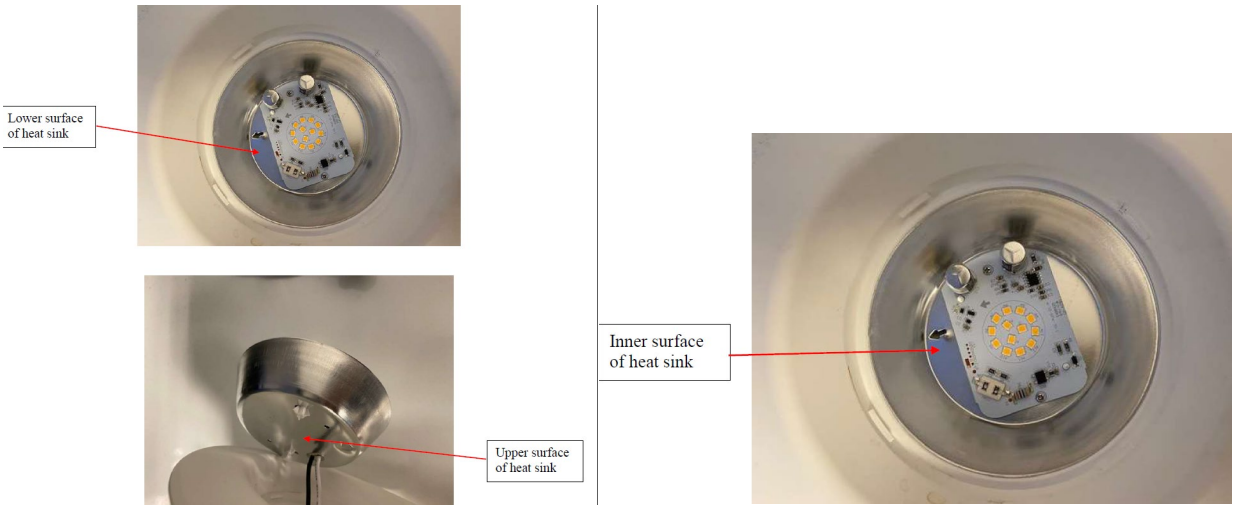
FIG. 8

(*See*, *e.g.*, 6:62-66, 7:23-27, 7:36-38, 7:65-8:3, 8:4-8, 8:20-22, 9:42-44.) Accordingly, a person of ordinary skill would understand that the "inner surface" of the heat sink must be something different than the bottom surface, top surface or side surface of the heat sink.

The claims also state that a heat sink comprises "an upper surface and a lower surface" (claims 16 and 30; *see also claims* 7, 23, 31, and 34) which, again, indicates to a person of ordinary skill that an "inner surface" of the heat stink must be something other than an upper surface or a lower surface.

Signify asserts that the inner-surface terms ("[LED light source coupled to the] inner surface of the heat sink" / "heat sink includes an inner surface") should be afforded their plain and ordinary meaning, but has not taken any position on what the plain and ordinary meaning is. The heat sink described in the '479 patent specification does have fins 311, which do provide an "inner surface" of a heat sink (*see*, *e.g.*, Figs. 9 and 10), but it would not make sense to couple a LED to the surface of a heat sink fin.

Signify's Preliminary Infringement Contentions suggest that it contends that the "lower surface" of heat sink is the same thing as the "inner surface" of the heat sink:



(Ex. I, Signify PIC, Ex. H-4 at 3, 58.) But, claims 6 and 7 make clear that an "inner surface" is something different than a "lower surface" by using the two terms differently in dependent claims:

> 6. The downlight module of claim 1, wherein the heat sink comprises a first heat sink and a second heat sink, *an inner surface of the second heat sink* surrounding at least a portion of a reflector.

7. The downlight module of claim 6, wherein the *first heat sink comprises a lower surface*, the lower surface being non-planar.

Courts "presume that the use of these different terms in the claims connotes different meanings." *CAE Screenplates, Inc. v. Heinrich Fiedler Gmbh & Co. KG*, 224 F.3d 1308, 1317 (Fed. Cir. 2000) (finding that "bottom plane" is different than "'bottom' of the groove").

Accordingly, the phrases "inner surface of the heat sink" and "heat sink includes an inner surface" should be found indefinite.

IV. CONCLUSION

For all of the foregoing reasons, Satco respectfully requests that the Court adopt its proposed constructions.

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Respectfully submitted,

By: */s/ Janis E. Clements*

Janis E. Clements
Texas Bar. No. 04365500
GREENBERG TRAURIG, LLP
300 West 6th Street Suite 2050
Austin, TX 78701
Telephone: (512) 320-7200
Facsimile: (512) 320-7210
Email: clementsj@gtlaw.com

Scott Bornstein (*pro hac vice*)
Joshua L. Raskin (*pro hac vice*)
Julie P. Bookbinder (*pro hac vice*)
Jeffrey R. Colin (*pro hac vice*)
GREENBERG TRAURIG, LLP
MetLife Building, 200 Park Avenue
New York, NY 10002
Telephone: (212) 801-9200
Facsimile: (212) 801-6400
Email: bornsteins@gtlaw.com
Email: raskinj@gtlaw.com
Email: bookbinderj@gtlaw.com
Email: colinj@gtlaw.com

Robert P. Lynn, Jr. (*pro hac vice*)
Katharine S. Santos (*pro hac vice*)
LYNN GARTNER DUNNE, LLP
330 Old Country Road, Suite 103
Mineola, New York 11501
Telephone: (516) 742-6200
Email: rplynn@lgdlaw.com
Email: ksantos@lgdlaw.com

Attorneys for Plaintiff Satco Products, Inc

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing document was electronically filed with the Court and that counsel of record, who are deemed to have consented to electronic service in the above-referenced case, are being served this 4th day of October, 2021, with a copy of the above-document via the Court's CM/ECF System.

/s/ *Janis E. Clements*
Janis E. Clements